

**DEPARTMENT OF TRANSPORTATION****DIVISION OF ENGINEERING SERVICES**

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 13.28**WELDING INSPECTION REPORT****Resident Engineer:**Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-006140**Date Inspected:** 09-Apr-2009**Project Name:** SAS Superstructure**OSM Arrival Time:** 700**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1530**Contractor:** Oregon Iron Works Clackamas, Or.**Location:** Clackamas, OR**CWI Name:** Mike Gregson, Rob Walters**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Hinge K Pipe Beams**Summary of Items Observed:**

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The Quality Assurance Inspector Sean Vance arrived on site at Oregon Iron Works, Inc (OIW) in Clackamas, OR, to randomly observe the in process welding of the Hinge K Pipe Beam assemblies. The QA Inspector arrived on site to randomly observe the OIW Quality Control (QC) Inspectors in process and completed visual and nondestructive testing. Upon the arrival of the QA Inspector the following observations were made:

**Hinge-K Pipe Beam Fuse Assembly 120A-1:****a125 Stiffener Ring Weld Repairs**

QA Inspector spoke with QC Inspector Mike Gregson and Mr. Gregson explained that there were two base metal non-critical weld repairs, on completed fuse assembly 120A-1. QA Inspector reviewed the OIW weld repair report (WRR #2244-04) and noticed that one weld repair was a base metal arc strike on a internal ring stiffener, piece mark identified as a125, caused by the welder, during in-process welding of this particular ring stiffener.

Information on the weld repair report states that the arc strike is located approximately 4 5/8" (117.5mm) from the wall of fuse sub-assembly a124-6 and measures approximately 3/8" (9.5mm) wide x 2 9/16" (65mm) long x 1/8" (3.2mm) deep.

QA Inspector reviewed the disposition on this OIW weld repair report and information states as follows:

OIW production personell to grind arc strike to clean sound metal, qualified QC personell to perform VT/MT testing on area of excavation and determine depth, qualified QC personell to perform a hardness check on the area, prior to welding and qualified QC personell to perform final MT after welding is complete. QA Inspector noted

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this sequence appears to be in compliance with AWS D1.5, sections 3.10/3.3.7.4, base metal repairs of arc strikes.

QA Inspector reviewed the OIW weld repair report (WRR #2244-13) and noticed that the second weld repair was flame cut gouges in the bevel face on a internal ring stiffener, piece mark identified as a125, caused by the welder, during flame cutting of this particular ring stiffener. Information on the weld repair report states that the flame cut gouges are approximately 100mm in length and maximum depths of 6mm. QA Inspector reviewed the disposition on this OIW weld repair report and information states as follows:

OIW production personell to grind flame cut edges to clean sound metal, qualified QC personell to perform VT/MT testing on area of excavation and determine depth, qualified QC personell to perform a hardness check on the area, prior to welding and qualified QC personell to perform final MT after welding is complete. QA Inspector noted this sequence appears to be in compliance with AWS D1.5, section 12.17.6, base metal repairs.

QC Inspector Mike Gregson explained that OIW qualified welder #T23, Mr. John Tellone, would be completing these two weld repairs, in accordance with the following OIW approved welding procedure specification (WPS 3046). Mr. Gregson also explained that the in-process welding parameters (amps/volts) and appropriate pre-heat temperatures, would be monitored by a qualified QC Inspector.

### Procedure Qualification Records (PQR'S):

#### PQR #CS-068

QA Inspector arrived at Koon-Hall-Adrian Metallurgical to witness cutting and macro etch testing of plate samples, on OIW PQR CS-068 (FCAW 3G\_485 to 485).

QA Inspector noted that this particular PQR CS-068 test plate was completed and sent to Acuren Inspection testing laboratories for 100% radiograph testing (RT) on 3/31/09.

QA Inspector noted that Acuren Inspection personell performed 100% radiograph inspection (RT) on this PQR CS-068 test plate and notified QA Inspector Clete Henke and OIW QC Manager Tom Tomovik that this PQR test plate did not pass RT, due to lack of penetration at the weld root pass. QA Inspector Clete Henke arrived at Acuren Inspection testing laboratories to review the RT film images and agreed with the Koon-Hall-Adrian Metallurgical pesonell, that this was a lack of weld fusion at the root pass.

QA Inspector noted that QC Manager Tom Tomovik had arrived at Acuren Inspection Laboratories on 4/6/09 to also review the RT film and two end cut test samples on this PQR CS-068 and stated that this particular discontinuity was internal undercut and not a lack of penetration at the weld root pass. After further review with Acuren Inspection Testing personell, it was mutually agreed upon that this was acceptable internal undercut (less than 1mm deep).

QA Inspector noted that additional macro etch test samples were to be cut and applicable destructive testing was to be performed on this PQR test plate by Koon-Hall-Adrian Metallurgical personell on 4/10/09. QA Inspector arrived at Koon-Hall-Adrian Metallurgical on 4/10/09 and was informed by Koon-Hall-Adrian Metallurgical personell that the PQR macro etch test samples were acceptable, per AWS D1.5 standards. QA Inspector witnessed the cut macro etch test samples, measured the internal discontinuities to be less than 1mm deep and took digital photographs, as shown below.....

QA Inspector notified QC Manager Tom Tomovik that a request for information (RFI) should be submitted, addressing this issue and QA Inspector noted that this RFI has not been submitted by OIW and is still currently pending.

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OIW Fabrication Shop-Bay 3

Hinge-K Pipe Beam Base Assembly 102A-4:

a111-4 Forging to a110-4 Base Plate

QA Inspector randomly witnessed OIW welder #J6, Mr. Craig Jacobsen perform submerged arc welding (SAW) on CJP (AWS D1.5 TC-U9a-S) pipe beam base plate, (piece mark identified as a110-4), to pipe forging, (piece mark identified as a111-4).

QA Inspector spoke with QC Inspector Mike Gregson and Mr. Gregson explained that the OIW welder #J6 was welding according to the OIW approved welding procedure specification (WPS 4016). Mr. Gregson also explained that the in-process welding parameters (amps/volts) and appropriate pre-heat temperatures, were monitored by a qualified QC Inspector and were in compliance with this applicable welding procedure specification.

QA Inspector verified Mr. Craig Jacobson was currently qualified for this welding process/position and Mr. Craig Jacobson appeared to be in compliance with AWS D1.5 and the welding procedure specification (WPS 4016).

QA Inspector reviewed the applicable OIW approved drawings and noted these two sub-assemblies (a110-4/a111-4) would be identified as assembly 102A.

Hinge-K Pipe Beam Fuse Sub-Assembly 120A-10:

a125 Ring Stiffener to a124-10 Half Fuse

QA Inspector randomly witnessed OIW welder #O6, Mr. Tim O'Brian perform submerged arc welding (SAW) on internal ring stiffener, (piece mark identified as a125), to half fuse pipe assembly, (piece mark identified as a124-10). QA Inspector noticed this particular weld joint was designated as a partial joint penetration (PJP AWS D1.5 TC-P5-S) and Mr. Tim O'Brian was welding in the flat position (1G).

QA Inspector spoke with QC Inspector Mike Gregson and Mr. Gregson explained that the OIW welder #O6 was welding in accordance with the OIW approved welding procedure specification (WPS 4020). Mr. Gregson also explained that the in-process welding parameters (amps/volts) and appropriate pre-heat temperatures were monitored by a qualified QC Inspector and were in compliance with this applicable welding procedure specification.

QA Inspector verified in process pre-heat temperatures of 350 degrees fahrenheit, which is in accordance with the applicable OIW approved welding procedure specification (WPS 4020).

Hinge-K Pipe Beam Fuse Assembly 120A-2

a124-3 Half Fuse to a124-10 Half Fuse

QA Inspector randomly witnessed welder #S-53, Mr. Jerry Shepherd, perform submerged arc welding (SAW) on half fuse pipe assembly, (piece mark identified as a124-3) to half fuse pipe assembly, (piece mark identified as a124-10), for pipe fuse assembly 120A-2

QA Inspector noticed this butt weld joint was designated as a complete joint penetration (CJP AWS D1.5 B-U3) and Mr. Jerry Shepherd was welding in the flat position (1G).

QA Inspector spoke with QC Inspector Mike Gregson and Mr. Gregson explained that a qualified QC Inspector would be present to monitor in-process welding parameters (amps/volts) and in-process pre-heat temperatures, to verify they are in compliance with the applicable OIW approved welding procedure specification (WPS 4020).

QA Inspector verified in process pre-heat temperatures of 350 degrees fahrenheit, which is in accordance with the applicable OIW approved welding procedure specification (WPS 4020).

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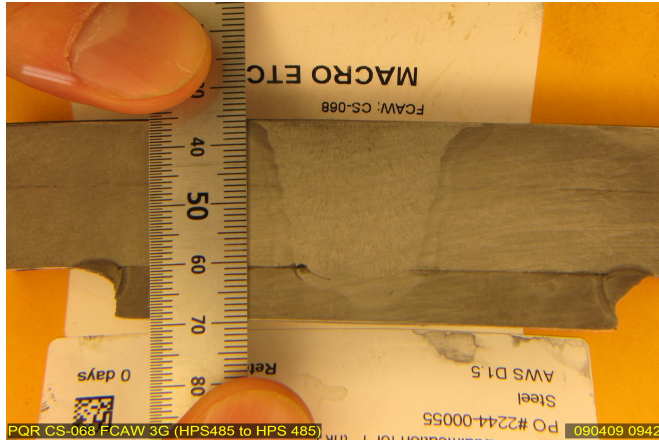
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### Material, Equipment, and Labor Tracking

QA Inspector Sean Vance performed a verification of personnel at Oregon Iron Works, Inc. and witnessed 6 OIW production personell and 2 QC.



### Summary of Conversations:

#### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mohammad Fatemi (916) 813-3677, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Vance,Sean	Quality Assurance Inspector
<b>Reviewed By:</b>	Adame,Joe	QA Reviewer

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